

# FFG Migration Scripts

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## Getting Started: Files Needed

The FFG (FFH and Gridded FFG) migration scripts require several NWSRFS “punch” files. Here’s a list:

1. segment definitions (for FFH and Gridded FFG)
2. headwater parameters (for FFH)
3. user control parameters (for FFH and Gridded FFG)
4. runoff adjustment for grid parameters (for Gridded FFG)
5. area parameters (for Gridded FFG)
6. group of product parameters (for FFH and Gridded FFG products)
7. product parameters (for FFH and Gridded FFG products)
8. text parameters (for FFH and Gridded FFG products)
9. 1, 3, 6, 12 (optional), and 24 (optional) hour Gridded Threshold Runoff XMRGs

Notes:

- #1 is created using “createNwsrfsPunchFile”
- #2 - #5 are created using “ffguid”
- #6 - #8 are created using “prodgen”

### ***Using “createNwsrfsPunchFile or fcinit\*\*” to extract segments***

- Same as done for migration of models – you can use the same segment file used to migrate the models

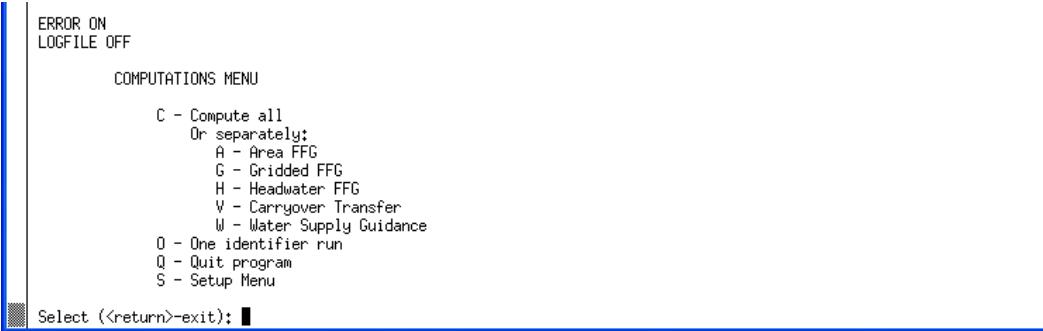
\*\* FFG migration does not require using createNwsrfsPunchFile; using fcinit is OK; If the punchfile you used to migrate the models already has the FFG operations in it you can just use that file \*\*

### ***Using “ffguid” to extract parameters***

- Run ffguid using ffg script

*ffg -p fguid*

shows the following screen:



## headwater parameters

- Press S – Setup Menu → H – Headwaters → 1 - list → to dump out headwater parameters
- enter an output file name (relative to where you are running this)
- select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- file is created
- select <return> twice to go back to screen shown above

## user control parameters

- Press S – Setup Menu → U – User Controls → 1 - list → to dump out parameters
- enter an output file name (relative to where you are running this)
- select <return> twice to go back to screen shown above

## runoff adjustment for grid parameters\*

- Press S – Setup Menu → R – Runoff Adjust for Grids → 1 - list → to dump out parameters
- enter an output file name (relative to where you are running this)
- select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- select <return> twice to go back to screen shown above

\* Note: not all RFCs have these parameters. The last time we looked MARFC, MBRFC, NERFC, and NCRFC had them.

## area parameters

- Press S – Setup Menu → A – Areas → 1 - list → to dump out parameters
- enter an output file name (relative to where you are running this)
- select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- select <return> twice to go back to screen shown above

## **Using PRODGEN to extract parameters**

- o Run ffguid using ffg script

*ffg -p prodgen*

shows the following screen:

```
ERROR ON  
LOGFILE OFF

PRODUCT GENERATION MENU
un-exi      exists      /fs/hseb/rfclx/rfc/nwsrfs/ffg/files/test/leecr/grpp/index
un-opn 24    seq on     /fs/hseb/rfclx/rfc/nwsrfs/ffg/files/test/leecr/grpp/index
un-clo 24    closed     /fs/hseb/rfclx/rfc/nwsrfs/ffg/files/test/leecr/grpp/index

Generate:
  1 - ALLPROD
  2 - FFGONLY
  3 - FFHONLY
P - Products Menu
Q - Quit program
S - Setup Menu

Select (number, P, S or <return>-exit): ■
```

### group of product parameters

- a. Press S – Setup Menu → G – Groups of Products → l - list → to dump out parameters
- b. enter an output file name (relative to where you are running this)
- c. select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- d. select <return> twice to go back to screen shown above

### product parameters

- a. Press S – Setup Menu → P – Products → l - list → to dump out parameters
- b. enter an output file name (relative to where you are running this)
- c. select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- d. select <return> twice to go back to screen shown above

### text parameters

- a. Press S – Setup Menu → T – Text → l - list → to dump out parameters
- b. enter an output file name (relative to where you are running this)
- c. select a number to start from (default is 1 – type <return>) then number to end at (default is MAX – type <return>) – **use defaults**
- d. select <return> twice to go back to screen shown above

## Am I ready to run the FFG migration scripts?

After testing the FFG migration scripts with the CAT, here are some things to be aware of when trying the migration of the legacy NWSRFS functionality to CHPS.

1. The FFG migration scripts rely on the linkages previously used by NWSRFS. For example, using the following NWSRFS segment as an example:

```
IDENTIFIER EGLN5          36.53    105.23
TITLE      EAGLE NEST DAM
UPSTREAM
DOWNSTREAM CMMN5X
DEF-TS
EGLN5      MAP      6           INPUT
..... .
END
SNOW-17    EGLN5A
EAGLE NEST DAM   2970. 36.5     FPDB
..... .
SAC-SMA    EGLN5B
EAGLE NEST DAM
..... .
FFG        EGLN5
EGLN5      EAGLE NEST DAM   0 0.00 0.00
EGLN5      SAC-SMA   EGLN5A
CLEAR-TS
EGLN5      SQIN     6           CARD INPUT
..... .
RDC0
YES SUMS
RAIM
EGLN5      INFW
```

The FFG operation with ID EGLN5 (in pink) refers to a SAC-SMA model with ID EGLN5A (in blue) and a snow model with ID EGLN5B (in green). The FFG operation is part of a segment named EGLN5X.

For the following FFG operation to migrate successfully it is assumed this segment was migrated to FEWS using the migration scripts. The result in FEWS would be:

- a. A FEWS module config directory named “egl5”  
  (./Config/ModuleConfig/egl5x)
  - b. A “Forecast” module config file for SNOW-17 and SAC-SMA
    - i. SACSMA\_EGLN5\_EGLN5A\_Forecast.xml
    - ii. SNOW17\_EGLN5\_EGLN5B\_Forecast.xml
2. In migrating the models, if the segment identifier, SNOW-17 module name, and/or SAC-SMA module name changed. The segment punch file should reflect these changes.
  3. It is helpful if the segment punch file does not contain “obsolete” segments. The segment should be removed and therefore the any FFG operations are removed.
  4. **(For FFH)** If the FFG id (in Pink) is changed, the FFH headwater parameters (extracted using FFGUID – see #1 above) should change. For example, if the following FFH headwater parameter file originally had the following entry:

hffg EGLN5	Waltreak	'Dutch Creek'	0	0
0 0 0 nonenone	4200 7178 6382 5585	-98 -98 0 0		
0 <b>EGLN5</b>	0 endid			

- The field in orange was used to link the FFH definition to an FFG ID (in Pink).
5. If FFH or GRIDDEDFFG was originally configured in NWSRFS to use retrieve the flood flow from the rating curve, the FFG migration scripts assume an entry exists in the ThresholdValueSets.xml file for the flood flow at a given location. The flood flow needed is the one associated with “PRIMARY FLOOD STAGE”
  6. **(For GRIDDEDFFG)** An ESRI shapefile of FFG Zones/Areas is needed to compute the area averages. Area averages are computed using existing FEWS functionality.

The <esriShapeFile> entry added to the “Polygons.xml” FEWS configuration file by the FFG migration scripts in most cases will need manual modifications. In our scripts the entries from the FFG area parameters file (#4 above) are converted into entries in the Polygons.xml file.

For example, the following entries in the FFG areas parameters file

```
affg MEZ020 ANDROSCOGGIN 0 2 MEZ020 0.60 1.00 1.15 1.25 1.50
affg MEZ001 'NWRN AROOSTOOK' 0 2 MEZ001 0.60 1.00 1.15 1.25 1.50
```

are converted into the following entries in the Polygons.xml file

```
<shape shapeId="Androscoggin" locationId="MEZ020"/>
<shape shapeId="Nwrn Aroostook" locationId="MEZ001"/>
```

Our scripts use column#1 for the locationId and column #3 for the shapeId. The shapeId entries will probably need manual modifications to match the strings used in the ESRI shapefile or they might need to be redone to match the attribute chosen for the <shapeIdAttributeName>.

**Note: Changing the locationId entries will require changes to the product parameters file (#6 above).** The locationId's are linked to how the FFG shef products are created. If you want to use different locationIds, you must change the product parameters file. For example the following entry from the product parameters file shows a product description for producing the FFG shef product for FFGME:

```
prod FFGME SHEF AFFG BOSFFGME E TTAA00 KTAR E 24 1 0
      FFGHD TEXT GRAY TEXT FFGDESC TEXT MAINE TEXT CARZONE TEXT
      MEZ001 AFFG MEZ002 AFFG MEZ006 AFFG MEZ003 AFFG MEZ004 AFFG
```

The ids in red represent the ids for which the FFG area values will be inserted. These ids must match the ids in the areas parameter file.

## Before Running FEWS-FFG migration script

Make a backup of your current Config directory. Note: migration scripts should be run on a FEWS Stand Alone version.

## Running the FEWS-FFG migration script

It is required to update the ffg.setting file, located in ..//ffgmigration/scripts/setting, to run a migration script.

### ***Update FFG setting file: ffg.setting***

The ffg.setting file is used to set up properties for FFH, Gridded FFG and Product Generator.

A sample ffgMigration setting files are provided under the /setting directory, however, users need to update the file's properties to point to where they are located at the RFC. The FFG properties are listed as follows:

**ohdBinDir:** Point to the directory where OHD executables are (e.g /nerfc\_sa/Models/ohd/bin)

**ffgInputDir:** Point to the directory where the NWSRFS legacy “punch” files (i.e. the files described above step #1- step #7)

**ffgParameterOutputDir:** temporary directory used to store parameter files

```
# The punch segment file  
#punchParamTextFile=abrfc.punchsegs  
punchParamTextFile=abrfc.ffg.text
```

```
# The setup punch file  
setupParamTextFile=abrfc.fff.setup
```

```
# the file prefix for files with gridded Threshold runoff values  
gridParamFile=xhr (#3 above)
```

```
# the prodgen text definitions  
inputParamTextFile=abrfc.ffg.text
```

```
# the prodgen product definitioins  
productParamTextFile=abrfc.ffg.products
```

```
# the OFS basin definitions  
basinPunchParamTextFile=abrfc.basins.punch
```

**userParamTextFile:** User Control Parameters filename (#2 above).

**setupParamTextFile:** Headwater Parameters filename (#1 above).

**runModule:** Generated products, all the options are case sensitive.

- a) FFH – This specifies migration scripts to migrate FFH product
- b) PRODGEN – This specifies migration scripts to migrate Product Generator
- c) GRIDDEDFFG – This specifies migration scripts to migrate Gridded FFG
- d) FFH\_GRIDDEDFFG – This specifies migration scripts to run FFH and Gridded FFG
- e) FFH\_PRODGEN – This specifies migration scripts to run FFH and Product Generator
- f) GRIDDEDFFG\_PRODGEN – This specifies migration scripts to run Gridded FFG and Product Generator
- g) ALL specifies migration scripts to run for FFH, Gridded FFG, and PRODGEN

**levelThresholdId:** Threshold level ID, this is set in file:

Config/RegionConfigFiles/ThresholdValueSets.xml

e.g: ACTION, MINOR, RECORD, BF, FS, MOD, MAJOR, ...

**fewsConfigDir:** Directory where current FEWS SA. Configuration directory is located

e.g. /awips/chps\_share(sa/fews/nerfc\_sa/Config

Note: this is the “Config” directory that will be updated.

**RFC:** rfc id name e.g. nerfc, abrfc, ncrfc..

**export JAVA\_HOME** - java home environment variable. This should be where your current java directory on your system. e.g export JAVA\_HOME=/awips/chps\_share/java

- **Setting properties for FFH configuration:**

A sample of property setting for FFH “**ffgMigration.setting.forFFH**” is provided under setting directory. See Appendix A for common definition of FFH migration properties.

- **Setting properties for PRODGEN configuration:**

A sample of property setting for PRODGEN “**ffgMigration.setting.forPRODGEN**” is provided under setting directory. See Appendix B for common definition of PRODGEN migration properties.

- **Setting properties for Gridded FFG configuration:**

A sample of property setting for gridded FFG “**ffgMigration.setting.forGRIDDEDFFG**” is provided under setting directory. See Appendix C for common definition of gridded FFG migration properties.

### ***Executing the Script: ./runFFGMigration.bash command***

From scripts directory, execute the runFFGMigration.bash script:

**For example: ./runFFGMigration.bash ..setting/ffgMigration.setting.For\_FFH**

Note: the sample ffgMigration.setting.forFFH is a FFH migration property setting file. It resides under **setting** directory. It can be placed anywhere. The full path for the setting file needs to specify in the scripts argument.

## What's Next?

### **What to expect after running FFG migration script.**

At the end of the run, should not see any errors.

The message “**Finished XXX Migration**” displays at completion of the run.

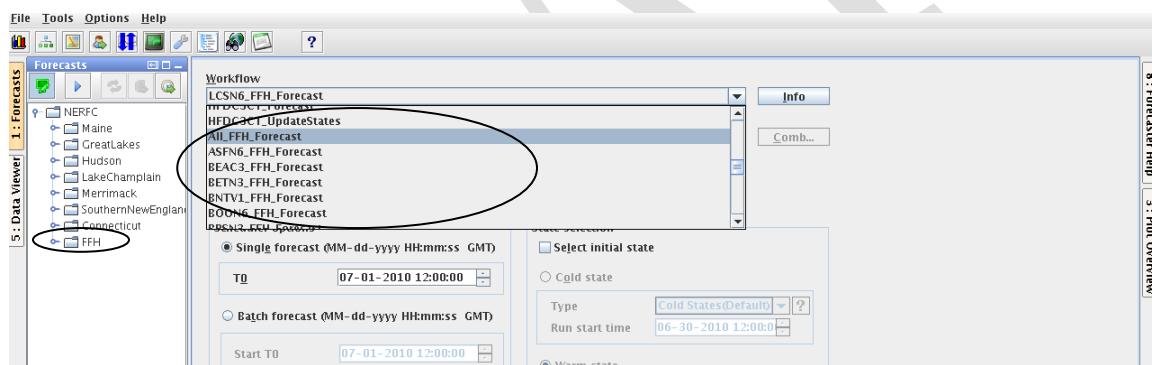
**FFH\_log.txt** file will be created during the run of migration scripts. This file is created inside the **scripts** directory. Information about the run is stored in this file, the first part is a list of locations that are successfully migrated, and the second part is a list of locations that failed to migrate. It is useful to use the information in the log file to verify the differences between current configuration and the RFS punch file.

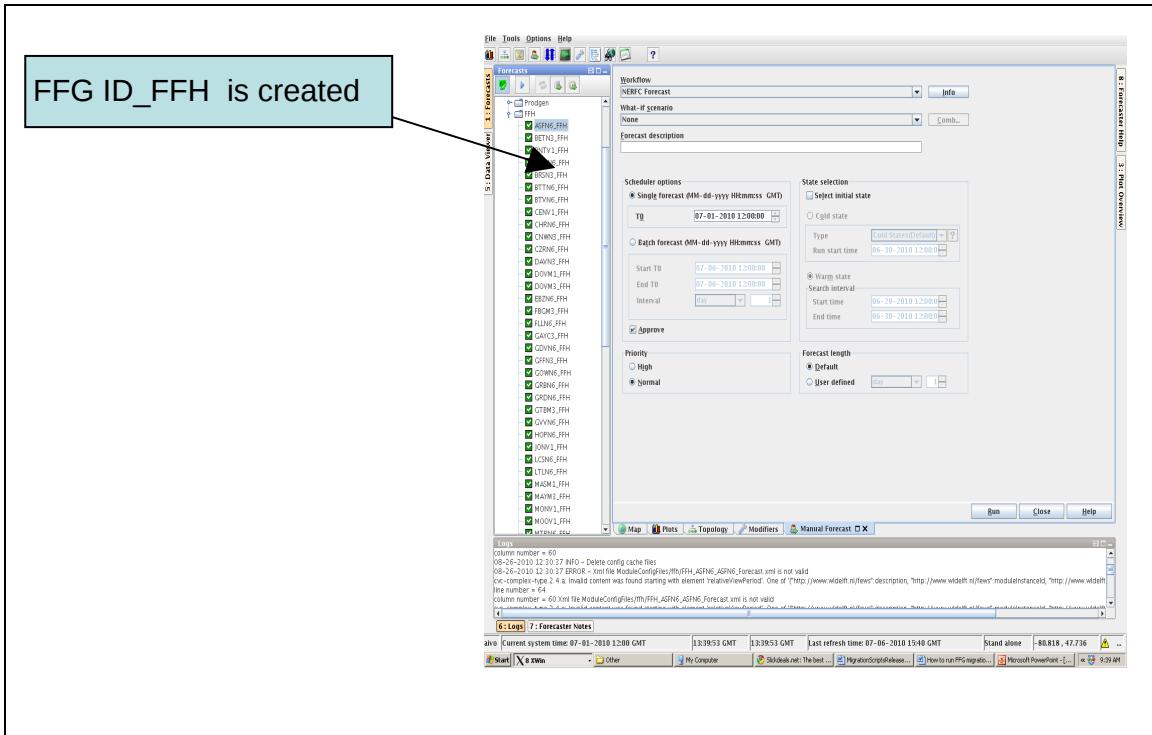
Bring up FEWS with the updated “Config” directory,

#### 1. For FFH migration:

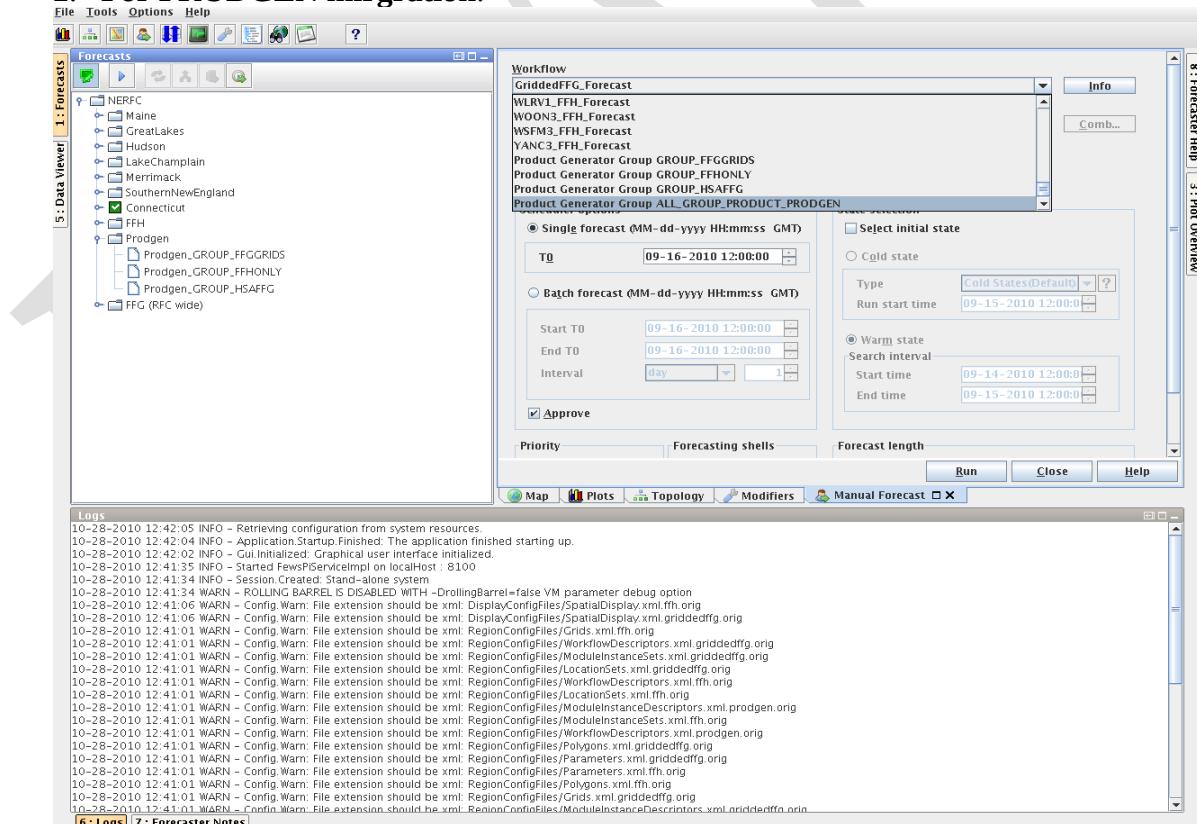
New FFH forecast folder will be created.

New FFH workflows will be added in the “manual forecast” list.

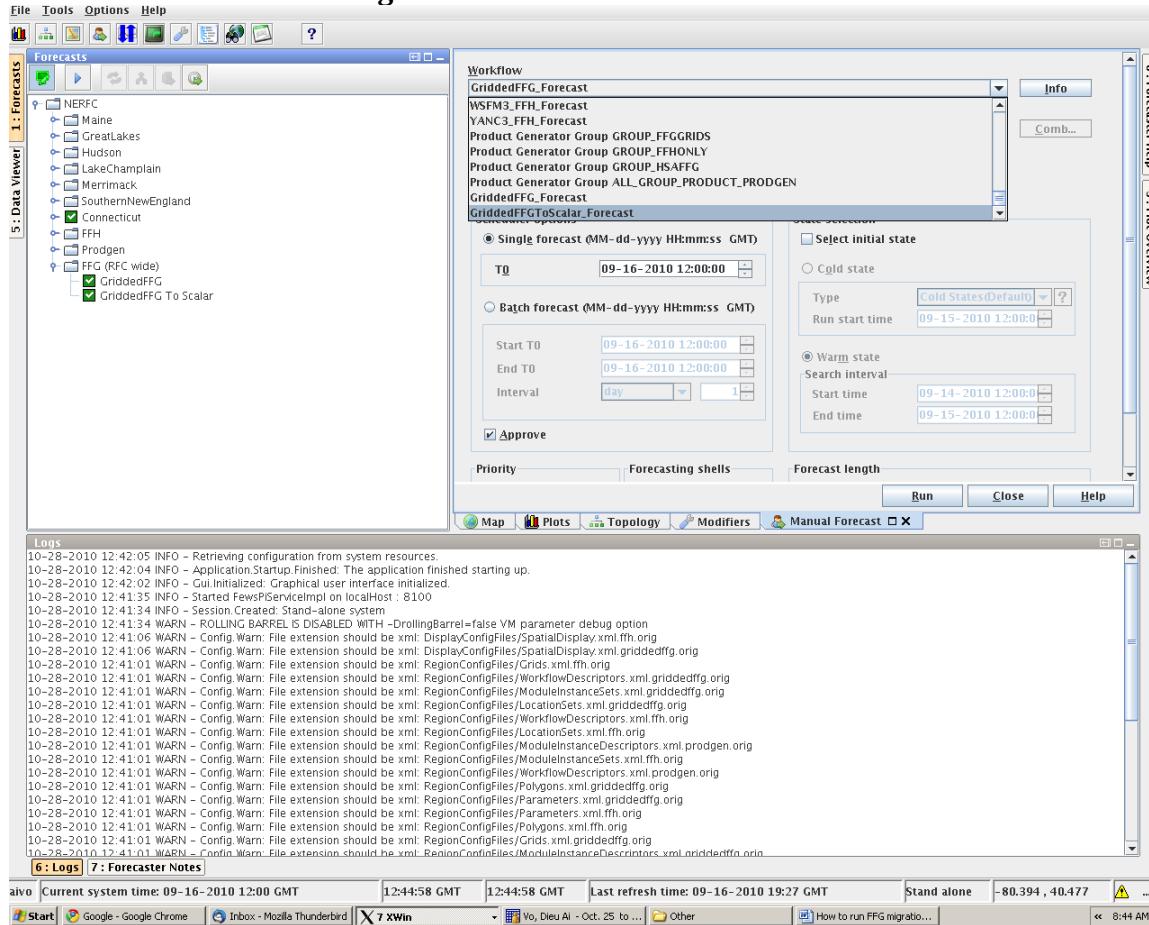




## 2. For PRODGEN migration:



### 3. For GRIDDFFG migration:



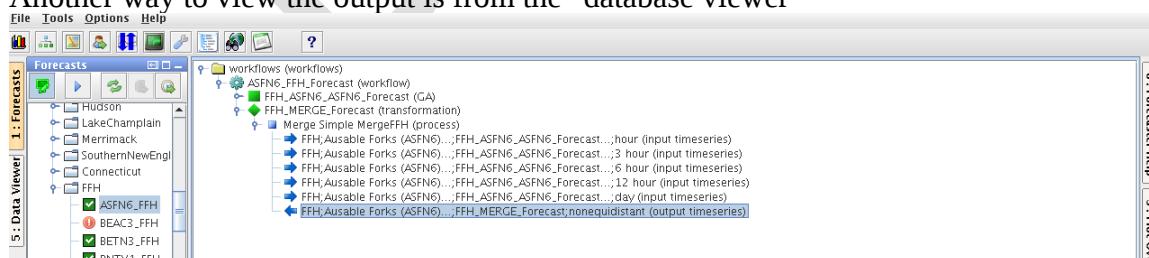
### Viewing output display

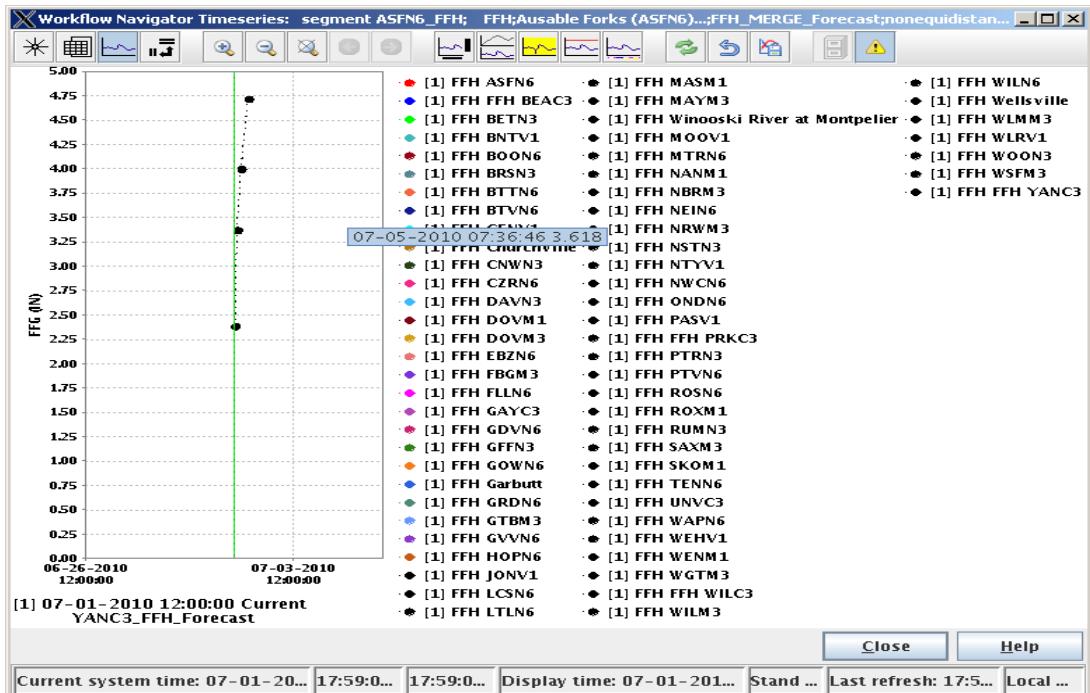
Using “Workflow Navigator” to view Product output.

#### 1. For FFH output

See below sample displays:

Note: this is the default display; OHD did not do anything to configure unique displays.  
Another way to view the output is from the “database viewer”



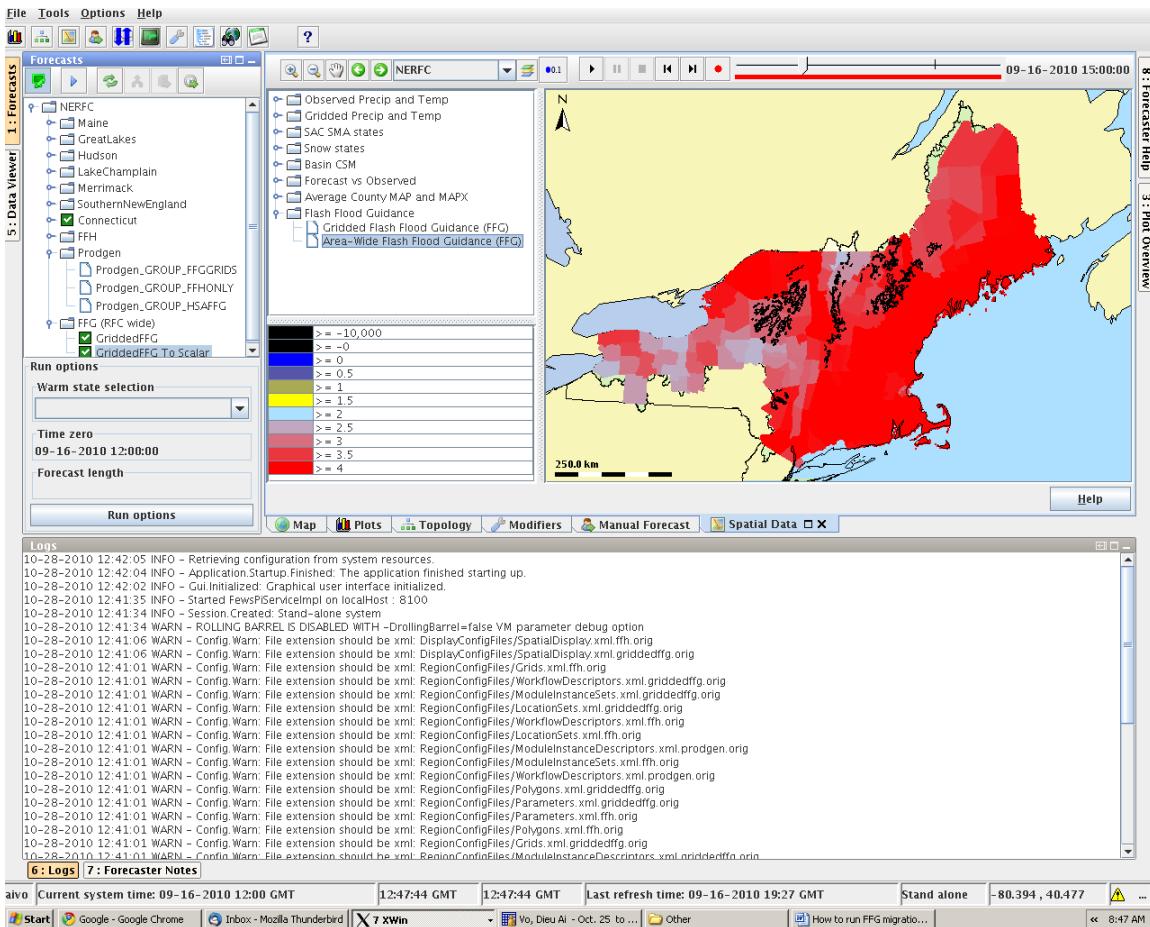


## 2. For PRODGEN output

Product outputs is by default saved under `../xxrfc_sa/Export` directory.

## 3. For Gridded FFG output.

To see the output of gridded FFG, from Tool Meun-> select Spatial Data ->Flash Flood Guidance->Gridded Flash Flood Guidance or Area-Wide Flash Flood Guidance. See display below:



# Appendix A

## Migration setting properties for FFH Configuration

```
runModule=FFH
# RFC, abrfc, nerfc, etc. XX is rfc ID.
RFC=XXrfc

# Directory with OHD jars and executables (e.g. /awips/chps_share/ohd/bin)
ohdBinDir=/awips/chps_share/ohd/bin

# Where ffg input directory with all the RFS punch files.
ffgInputDir=../../../../ohdfewsadapter/testData/ffgLegacyFiles/XXrfc

#temporary direcotry used to store parameter files.
ffgParameterOutputDir=../../../../chps_share/ffgLegacyFiles/output

# The punch segment file
punchParamTextFile=XXrfc.punchsegs

# The user punch file
userParamTextFile=XXrfc.ffg.user

# The setup punch file
setupParamTextFile=XXrfc.ffh.setup

# A FEWS Config directory
fewsConfigDir=/awips/chps_share /sa/XXrfc_sa/Config

# RFC level of threshold ID, i.e BT, ACTION, etc. See your RFC's
Config/RegionConfigFiles/ThresholdValueSets.xml

levelThresholdId=BF

# runing module can be GRIDDEDFFG, FFH, PRODGEN or ALL
runModule=FFH

# Is run a RFC for first time, YES/NO all upper cases, 1st time copy module parameter,
config files and workflow take longer time. By default is set to "YES"
isRunARFC1stTime=YES

export JAVA_HOME=/awips/chps_share/java – This should point to where current jre
on your system.
```

# Appendix B

## Migration setting properties for PRODGEN Configuration

On top of common properties needed in setting file, six properties required for PRODGEN are:

1. **userParamTextFile=XXrfc.ffg.user**
2. **setupParamTextFile=XXrfc.ffh.setup**
3. **areaParamTextFile=XXrfc.ffg.area**
4. **groupParamTextFile=XXrfc.ffg.groups**
5. **productParamTextFile=XXrfc.ffg.products**
6. **runModule =PRODGEN**

Sample setting file for PRODGEN:

```
# RFC, abrfc, nerfc, etc.  
RFC=XXrfc  
  
# Directory with OHD jars and executables (e.g. /awips/chps_share/ohd/bin)  
ohdBinDir=/awips/chps_share/ohd/bin  
  
# Where ffg input directory with all the RFS punch files.  
ffgInputDir=../../../../ohdfewsadapter/testData/ffgLegacyFiles/$RFC  
  
#temporary direcotry used to store parameter files.  
ffgParameterOutputDir=../../../../ohdfewsadapter/testData/ffgLegacyFiles/$RFC/output  
  
# The punch segment file  
#punchParamTextFile=abrfc.punchsegs  
punchParamTextFile=abrfc.ffg.text  
  
# The punch segment file; needed by GRIDDEDFFG and PRODGEN; soon to be  
removed; will use punchParamTextFile  
paramTextFile=XXrfc.punchsegs  
  
# The user punch file  
userParamTextFile=XXrfc.ffg.user  
  
# The setup punch file  
setupParamTextFile=XXrfc.ffh.setup  
  
# the ffg areas definition
```

```
areaParamTextFile=XXrfc.ffg.areas

# the prodgen text definitions
inputParamTextFile=abrfc.ffg.text

# the prodgen product definitioins
productParamTextFile=abrfc.ffg.products

# the OFS basin definitions

groupParamTextFile=abrfc.ffg.groups

# A FEWS Config directory
fewsConfigDir=/awips/chps_share /sa/XXrfc_sa/Config

# RFC level of threshold ID, i..e BT, ACTION, etc. See your RFC's
Config/RegionConfigFiles/ThresholdValueSets.xml

levelThresholdId=BF

# runing module – this is a common property for all products. When running migrations
for PRODGEN configuration, this property is set to:
runModule =PRODGEN

# isRunARFC1stTime property: YES/NO all upper cases. For the first time, set to
“YES”, the scripts would copy module parameters, config files and workflow to a
temporary directory. This would take longer time to run the script when set to “YES”.
isRunARFC1stTime=YES

export JAVA_HOME=/awips/chps_share/java
```

# Appendix C

## Migration Setting properties for GriddedFFG

```
# RFC, nerfc, nerfc, etc.  
RFC=nerfc  
# Directory with OHD jars and executables (e.g. /awips/chps_share/ohd/bin)  
ohdBinDir=../../ohdfewssadapter/Modules/bin  
  
# Where ffg input directory with all the RFS punch files.  
ffgInputDir=../../../../ohdfewssadapter/testData/ffgLegacyFiles/$RFC  
  
#temporary direcotry used to store parameter files.  
ffgParameterOutputDir=../../../../ohdfewssadapter/testData/ffgLegacyFiles/$RFC/output  
  
# The punch segment file  
punchParamTextFile=nerfc.punchsegs  
  
# The user punch file  
userParamTextFile=nerfc.ffg.user  
  
# the file prefix for files with gridded Threshold runoff values  
gridParamFile=xhr  
  
# the ffg areas definition  
areaParamTextFile=nerfc.ffg.areas  
  
# the OFS basin definitions  
basinPunchParamTextFile=nerfc.basins.punch  
  
# the threshR grid parameter adjustments - optional (nerfc - yes, nerfc - no)  
gdpmParamTextFile=nerfc.ffg.gdpm  
  
# the esri Shape File Name - for polygons xml file  
griddedFFGShapeFile=ShapeFileName  
  
# the shape Id Attribute Name - for polygons xml file  
griddedFFGShapeFileAttribute=ShapeIdAttributeName  
  
# A FEWS Config directory(Using $USER to avoid hard-coded user name)  
fewsConfigDir=/awips/chpshome/$USER/nerfc_sa/Config  
  
# RFC level of threshold ID, i..e BT, ACTION, etc. See your RFC's  
Config/RegionConfigFiles/ThresholdValueSets.xml  
levelThresholdId=ACTION
```

```
# runing module can be GRIDDEDFFG, FFH, PRODGEN or ALL  
runModule=GRIDDEDFFG  
  
# Is run a RFC for first time, YES/NO all upper cases, 1st time copy module parameter,  
config files and workflow take longer time  
isRunARFC1stTime=YES  
  
export JAVA_HOME=/awips/hydroapps/CHPS_jdk/java
```

